NATIONAL BUREAU OF STANDARDS REPORT

NBS PROJECT | **NBS REPORT**

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Development, Testing, and Evaluation of Visual Landing Aids

Consolidated Progress Report

to the

Airborne Equipment Division
Bureau of Aeronautics
Department of the Navy

For the Period
April 1 to June 30, 1954

for
Bureau of Aeronautics Projects

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NBS

U. S. DEPARTMENT OF COMMERCE
NATIONAL BUREAU OF STANDARDS

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Approved for public release by the Director of the National Institute of Standards and Technology (NIST) on October 9, 2015

Development, Testing, and Evaluation of Visual Landing Aids

Quarter Ending June 30, 1954

Laboratory Tests

Test No. Requested

Study of the life characteristics of 36 seadrome-light batteries.

21A-3/54 In conference 2-12-54
Letter dated 3-16-54

Status: Mathematical analysis completed, two life tests completed, third life test planned, informal report provided for BuAer guidance, written report in preparation.

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Electrical characteristics of four amperites.

21A-4/54 By telephone 3-9-54

Status: Report submitted 4-8-54. Amperites were found to be an improvement on previous designs.

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Photometric and colorimetric characteristics of two approach-angle lights.

21A-5/54 In conference 3-31-54

Status: Test completed, report in preparation.

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Consultation Activities

The text of the first Part of the proposed U. S. Standard for signal-light colors has been revised and discussed with representatives of the Corning and Kopp Glass Companies. The text appears satisfactory for general circulation but the diagrams proved too difficult to interpret. A set of eight new diagrams is about 80% completed.

Mr. Breckenridge has attended two meetings of the Lighting and Marking Panel as an advisor, a meeting of the Aviation Lighting Committee held in conjunction with one of the Lighting and Marking Panel meetings,

a meeting of the executive subcommittee of the Aviation Lighting Committee, and one session of a meeting of the Armed Forces, N.R.C., Vision Committee.

Study of heliport lighting

A new model of an approach-angle light has been designed by Mr. R. W. Crouch. This indicator requires approximately one-half the power required for the units submitted by the Bureau of Aeronautics for test. (21A-5/54 above). It is also lighter, smaller and provides color indications with smaller angles of uncertainty than the units submitted. A model of this design has been furnished the Marine Corps for flight tests in accordance with arrangements made in conference with Bureau of Aeronautics representatives.

Kinorama research

At the close of the last quarter two problems which had come out of the attempt to validate the kinorama were delaying the validation. They were problems which had not been serious for the work done with the old laboratory kinorama nor for the demonstrations which had been made with the prototype model. A higher standard of performance, however, appeared imperative if the kinorama is to be used for work on controversial problems. These problems were the synchronizing of the recorder mechanism with the tape of the kinorama and the elimination of unintended cues.

Of these problems, the second is the more important. Experiments have been made in an effort to conceal the unwanted cues by a veiling illumination and a fluorescent filter has given promise of being satisfactory for this purpose. Further tests confirmed this conclusion but showed it would be necessary to increase the contrast between the lights and the background. An effort was made to do this by using a different ultraviolet filter between the irradiator and the tape but no improvement resulted. As another means of obtaining increased contrast, efforts were made to find a satisfactory dark material for the tape. A dark rubber material proved to be an improvement from the visual standpoint but a tape made of it could not be made to track properly. Efforts were then made to dye the tracing cloth which had been used as the tape and this was finally accomplished by using an alcohol soluble dye combined with a quick drying technique. Tapes made by this process appeared satisfactory until the weather became humid when wrinkles appeared in them. Comparison of these tapes with undyed tapes showed that the undyed tapes had been similarly affected. An attempt was made to overcome the wrinkling by installing a dehumidifier. By this means the humidity within the kinorama itself could be reduced substantially but no method of changing tapes or servicing the equipment without admitting damp air to the kinorama appeared feasible. If a trailer were available for housing the equipment, it is probable that the entire interior could be satisfactorily airconditioned. Since no trailer has as yet been obtained, the

effort to obtain a belt that will remain flat in a humid atmosphere was renewed. Experiments with a nylon belt were unsatisfactory, and we are now working again with the rubber belt. It is believed that the tracking problem can be solved by providing a more positive means of towing the belt.

During the previous quarter a new circuit was devised for synchronizing the recorder and tape optically and the construction of two new phototube chassis for this purpose was started. These have been completed and installed.

Other progress with the kinorama includes the replacement of the temporary wiring in the telescope assembly with permanent wiring and the development of a special grid on transparent plastic for analyzing records of kinorama runs. This grid was found quite useful in checking experimental runs.

Seadrome lights

Progress has been made with the development of seadrome lights through the completion of the tests on the amperites (21A-4/54 above) and two life tests on seadrome light batteries (21A-3/54). These latter have not yet been reported as a third life test is to be included in this test.

Airfield lighting control panel

A contract was awarded to the Federal Electric Co. during the fiscal year 1953 to build an experimental airfield lighting control panel. For a long period the company showed no progress on its contract, but several months ago, in response to pressure, production was started. The company then experienced difficulty in devising a layout which would come within the specified limits of size. A satisfactory layout was devised at this Bureau and it is understood that the control panel has now been completed except for the labeling of the switches. As soon as we have been informed that the labelling has been finished, arrangements will be made for the inspection of this panel at the company's plant.